#include <Wire.h>

#include <ESP8266WiFi.h>

#include <WiFiClientSecure.h>

**// MPU-6050 variables remain unchanged**

const int MPU\_addr = 0x68;

int16\_t AcX, AcY, AcZ, Tmp, GyX, GyY, GyZ;

float ax = 0, ay = 0, az = 0, gx = 0, gy = 0, gz = 0;

boolean fall = false;

boolean trigger1 = false;

boolean trigger2 = false;

boolean trigger3 = false;

byte trigger1count = 0;

byte trigger2count = 0;

byte trigger3count = 0;

int angleChange = 0;

**// WiFi network info**

const char \*ssid = "Rukku";

const char \*pass = "12345678";

**// Telegram Bot info**

const char \*telegramBotToken = "7633408153:AAEAvm9xmqcQuup5\_H8L2cNqVgEW6s-lkAw";

const char \*chatID = "6653213439";

const int SolenoidPin = 2;

void setup() {

Serial.begin(115200);

Wire.begin(4, 12);

Wire.beginTransmission(MPU\_addr);

Wire.write(0x6B);

Wire.write(0);

Wire.endTransmission(true);

Serial.println("Wrote to IMU");

Serial.println("Connecting to WiFi...");

WiFi.begin(ssid, pass);

while (WiFi.status() != WL\_CONNECTED) {

delay(500);

Serial.print(".");

}

Serial.println("\nWiFi connected");

pinMode(SolenoidPin, OUTPUT);

digitalWrite(SolenoidPin, LOW);

}

void loop() {

mpu\_read();

ax = (AcX - 2050) / 16384.00;

ay = (AcY - 77) / 16384.00;

az = (AcZ - 1947) / 16384.00;

gx = (GyX + 270) / 131.07;

gy = (GyY - 351) / 131.07;

gz = (GyZ + 136) / 131.07;

float Raw\_Amp = pow(pow(ax, 2) + pow(ay, 2) + pow(az, 2), 0.5);

int Amp = Raw\_Amp \* 10;

Serial.println(Amp);

if (Amp <= 2 && trigger2 == false) {

trigger1 = true;

Serial.println("TRIGGER 1 ACTIVATED");

}

if (trigger1) {

trigger1count++;

if (Amp >= 12) {

trigger2 = true;

Serial.println("TRIGGER 2 ACTIVATED");

trigger1 = false;

trigger1count = 0;

}

}

if (trigger2) {

trigger2count++;

angleChange = pow(pow(gx, 2) + pow(gy, 2) + pow(gz, 2), 0.5);

Serial.println(angleChange);

if (angleChange >= 30 && angleChange <= 400) {

trigger3 = true;

trigger2 = false;

trigger2count = 0;

Serial.println("TRIGGER 3 ACTIVATED");

}

}

if (trigger3) {

trigger3count++;

if (trigger3count >= 10) {

angleChange = pow(pow(gx, 2) + pow(gy, 2) + pow(gz, 2), 0.5);

Serial.println(angleChange);

if ((angleChange >= 0) && (angleChange <= 10)) {

fall = true;

trigger3 = false;

trigger3count = 0;

Serial.println("FALL DETECTED");

sendTelegramMessage("Fall detected!");

digitalWrite(SolenoidPin, HIGH);

delay(5000);

digitalWrite(SolenoidPin, LOW);

fall = false;

} else {

trigger3 = false;

trigger3count = 0;

}

}

}

delay(100);

}

void mpu\_read() {

Wire.beginTransmission(MPU\_addr);

Wire.write(0x3B);

Wire.endTransmission(false);

Wire.requestFrom(MPU\_addr, 14, true);

AcX = Wire.read() << 8 | Wire.read();

AcY = Wire.read() << 8 | Wire.read();

AcZ = Wire.read() << 8 | Wire.read();

Tmp = Wire.read() << 8 | Wire.read();

GyX = Wire.read() << 8 | Wire.read();

GyY = Wire.read() << 8 | Wire.read();

GyZ = Wire.read() << 8 | Wire.read();

}

void sendTelegramMessage(String message) {

WiFiClientSecure client;

client.setInsecure();

if (!client.connect("api.telegram.org", 443)) {

Serial.println("Connection failed!");

return;

}

String url = "/bot";

url += telegramBotToken;

url += "/sendMessage?chat\_id=";

url += chatID;

url += "&text=";

url += message;

client.print(String("GET ") + url + " HTTP/1.1\r\n" +

"Host: api.telegram.org\r\n" +

"Connection: close\r\n\r\n");

Serial.println("Message sent!");

}